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6531303	6

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### Search History

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L2: Entry 6 of 6

File: USPT

Mar 11, 2003

US-PAT-NO: 6531303DOCUMENT-IDENTIFIER: US 6531303 B1

TITLE: Method of producing geranylgeraniol

DATE-ISSUED: March 11, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Millis; James R.	Kohler	WI		
Maurina-Bunker; Julie	Appleton	WI		
McMullin; Thomas W.	Manitowoc	WI		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Arkion Life Sciences LLC	Wilmington	DE			02

APPL-NO: 09/350275 [PALM]

DATE FILED: July 6, 1999

## PARENT-CASE:

REFERENCE TO RELATED APPLICATION This application claims priority from U.S. Provisional Application Serial No. 60/091,964, filed Jul. 6, 1998, entitled "Production of Farnesol and Geranylgeraniol."

INT-CL-ISSUED: [07] C12P 7/02, C12N 9/10, C12N 15/00, C12N 15/74, C12N 15/01

## INT-CL-CURRENT:

TYPE IPC	DATE
CIPS <u>C12 N 9/10</u>	20060101
CIPS <u>C12 N 9/02</u>	20060101
CIPS <u>C07 D 311/72</u>	20060101
CIPS <u>C07 D 311/00</u>	20060101
CIPS <u>C12 P 7/02</u>	20060101
CIPS <u>C12 P 7/04</u>	20060101

US-CL-ISSUED: 435/155; 435/193, 435/254.21, 435/320.1, 435/471, 435/441

US-CL-CURRENT: 435/155; 435/193, 435/254.21, 435/320.1, 435/441, 435/471

FIELD-OF-CLASSIFICATION-SEARCH: 435/155, 435/254.21, 435/441, 435/320.1, 435/471, 435/193

See application file for complete search history.

## PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

  

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/> <u>4871721</u>	October 1989	Biller	514/102
<input type="checkbox"/> <u>5589372</u>	December 1996	Robinson et al.	435/193
<input type="checkbox"/> <u>5766911</u>	June 1998	Koike et al.	435/193

## FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
393690	October 1990	EP	
486290	May 1992	EP	
769551	April 1997	EP	

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Yamano et al., 1994, Biosci. Biotechnol. Biochem. 58:1112-1114.

ART-UNIT: 1652

PRIMARY-EXAMINER: Achutamurthy; Ponnathapura

ASSISTANT-EXAMINER: Walicka; Malgorzata A

ATTY-AGENT-FIRM: Ross, P.C.; Sheridan

ABSTRACT:

The invention provides a biological method of producing geranylgeraniol.

14 Claims, 24 Drawing figures

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[Next Doc](#)

[Go to Doc#](#)

3 1-15 bib

L3 ANSWER 1 OF 15 PCTFULL COPYRIGHT 2007 Univentio on STN  
AN 2007003346 PCTFULL ED 20070116 EW 200702  
TIEN FUNGICIDAL AGENTS  
TIFR AGENTS FONGICIDES  
IN MENDGEN, Kurt, Fischerstrasse 32, 78464 Konstanz, DE;  
PIEL, Joern, Koblenzer Strasse 79, 53177 Bonn, DE;  
VAHLENKAMP, Heinz, Rometstrasse 6, 78244 Gottmadingen, DE;  
GIELE, Christine, Austrasse 93, 78467 Konstanz, DE;  
WIRSEL, Stefan, G., R., Adolf-von-Harnack-Strasse 25, 06114 Halle, DE;  
HOFFMANN, Jochen, Kapellenstrasse 5, 86368 Gersthofen, DE;  
BOLAND, Wilhelm, Carl-Ortf-Strasse 21, 07743 Jena, DE;  
JUX, Andreas, Grenzhoefer Weg 2, 68123 Heidelberg, DE  
PA MAX-PLANCK-GESELLSCHAFT ZUR FOeRDERUNG DER WISSENSCHAFTEN E.V.,  
Hofgartenstrasse 8, 80539 Muenchen, DE  
AG VOSSIUS & PARTNER, Siebertstrasse 4, 81675 Munich, DE  
LAF English  
LA English  
DT Patent  
PI WO 2007003346 A2 20070111  
DS W: AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR  
CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HN HR HU  
ID IL IN IS JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU  
LV LY MA MD MG MK MN MW MX MZ NA NG NI NO NZ OM PG PH PL  
PT RO RS RU SC SD SE SG SK SL SM SY TJ TM TN TR TT TZ UA  
UG US UZ VC VN ZA ZM ZW  
RW (ARIPO): BW GH GM KE LS MW MZ NA SD SL SZ TZ UG ZM ZW  
RW (EAPO): AM AZ BY KG KZ MD RU TJ TM  
RW (EPO): AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LT  
LU LV MC NL PL PT RO SE SI SK TR  
RW (OAPI): BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG  
PRAI EP 2005-05014666 20050706  
AI WO 2006-EP6330 A 20060629

L3 ANSWER 2 OF 15 USPATFULL on STN  
AN 2004:315541 USPATFULL  
TI Method of making teprenone  
IN Saucy, Gabriel G., Essex Fells, NJ, UNITED STATES  
PI US 2004249219 A1 20041209  
AI US 2001-899418 A1 20010703 (9)  
PRAI US 2000-215897P 20000705 (60)  
DT Utility  
FS APPLICATION  
LREP SHERIDAN ROSS PC, 1560 BROADWAY, SUITE 1200, DENVER, CO, 80202  
CLMN Number of Claims: 29  
ECL Exemplary Claim: 1  
DRWN 9 Drawing Page(s)  
LN.CNT 1388  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 3 OF 15 USPATFULL on STN  
AN 2004:144592 USPATFULL  
TI Production of farnesol and geranylgeraniol  
IN Millis, James R., Kohler, WI, UNITED STATES  
Maurina-Bunker, Julie, Appleton, WI, UNITED STATES  
McMullin, Thomas W., Manitowoc, WI, UNITED STATES  
PA Arkion Life Sciences LLC. (U.S. corporation)  
PI US 2004110257 A1 20040610  
AI US 2003-719196 A1 20031120 (10)  
RLI Continuation of Ser. No. US 2001-909558, filed on 20 Jul 2001, GRANTED,  
Pat. No. US 6689593 Continuation of Ser. No. US 1999-350275, filed on 6  
Jul 1999, GRANTED, Pat. No. US 6531303  
PRAI US 1998-91964P 19980706 (60)

DT Utility  
FS APPLICATION  
LREP SHERIDAN ROSS PC, 1560 BROADWAY, SUITE 1200, DENVER, CO, 80202  
CLMN Number of Claims: 17  
ECL Exemplary Claim: 1  
DRWN 11 Drawing Page(s)  
LN.CNT 3450

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 4 OF 15 EPFULL COPYRIGHT 2007 EPO/FIZ KA on STN

AN 2001:105391 EPFULL  
DUPD 20040331 DUPW 200414  
TIEN Method for production of geranylgeraniol and analogous compounds thereof by microorganisms.  
TIFR Procede de preparation de geranylgeraniol et de composes analogues a l'aide de microorganismes.  
TIDE Verfahren zur Herstellung von Geranylgeraniol und analogen Verbindungen durch Mikroorganismen.  
IN Muramatsu, Masayoshi, c/o TOYOTA Jidosha Kabushiki Kaisha, 1, Toyota-cho, Toyota-shi, Aichi 471-8571, JP; Obata, Shusei, c/o TOYOTA Jidosha Kabushiki Kaisha, 1, Toyota-cho, Toyota-shi, Aichi 471-8571, JP; Shimizu, Sakayu, c/o TOYOTA Jidosha Kabushiki Kaisha, 1, Toyota-cho, Toyota-shi, Aichi 471-8571, JP  
PA TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi 471-8571, JP  
PAN 203744  
AG Leson, Thomas Johannes Alois, Dipl.-Ing., Tiedtke-Buehling-Kinne & Partner GbR, TBK-Patent, Bavariaring 4, 80336 Muenchen, DE  
AGN 78982  
DT Patent  
LAF English  
LA English  
LAP English  
TL German; English; French  
PIT EPA3 Separate publication of search report  
PI EP 1219714 A3 20040331  
DS AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR  
EXTENSION STATES: AL LT LV MK RO SI  
AI EP 2001-130424 A 20011220  
PRAI JP 2000-401266 A 20001228  
JP 2001-376173 A 20011210

L3 ANSWER 5 OF 15 EPFULL COPYRIGHT 2007 EPO/FIZ KA on STN

AN 2001:105388 EPFULL UP 20050803  
DUPD 20050803 DUPW 200531  
TIEN High production method of prenyl alcohol by microorganisms.  
TIFR Procede de production elevee d'alcool prenylique par des micro-organismes.  
TIDE Verfahren mit hoher Produktionskapazitaet von Prenylalkohol durch Mikroorganismen.  
IN Muramatsu, Masayoshi, c/o TOYOTA Jidosha Kabushiki Kaisha, 1, Toyota-cho, Toyota-shi, Aichi 471-8571, JP; Obata, Shusei, c/o TOYOTA Jidosha Kabushiki Kaisha, 1, Toyota-cho, Toyota-shi, Aichi 471-8571, JP; Shimizu, Sakayu, c/o TOYOTA Jidosha Kabushiki Kaisha, 1, Toyota-cho, Toyota-shi, Aichi 471-8571, JP  
PA TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi 471-8571, JP  
PAN 203744  
AG Leson, Thomas Johannes Alois, Dipl.-Ing., Tiedtke-Buehling-Kinne & Partner GbR, TBK-Patent, Bavariaring 4, 80336 Muenchen, DE

AGN 78982  
DT Patent  
LAF English  
LA English  
LAP English  
TL German; English; French  
PIT EPB1 Granted patent  
PI EP 1219704 B1 20040811  
DS DE FR GB  
AI EP 2001-130425 A 20011220  
PRAI JP 2000-401951 A 20001228  
JP 2001-375842 A 20011210  
REN CHAMBON C ET AL: "ISOLATION AND PROPERTIES OF YEAST MUTANTS Affected IN FARNESYL DIPHOSPHATE SYNTHETASE" CURRENT GENETICS, NEW YORK, NY, US, vol. 18, 1990, pages 41-46, XP002909498 ISSN: 0172-8083  
REP WO 2000001650 A

L3 ANSWER 6 OF 15 USPATFULL on STN  
AN 2003:181739 USPATFULL  
TI Method of vitamin production  
IN Millis, James R., Kohler, WI, UNITED STATES  
Saucy, Gabriel G., Essex Fells, NY, UNITED STATES  
Maurina-Brunker, Julie, Appleton, WI, UNITED STATES  
McMullin, Thomas W., Manitowoc, WI, UNITED STATES  
PA DCV, Inc., d/b/a Bio-Technical Resources (U.S. corporation)  
PI US 2003125573 A1 20030703  
AI US 2001-902187 A1 20010709 (9)  
RLI Continuation of Ser. No. US 1999-348097, filed on 6 Jul 1999, PENDING  
PRAI US 1998-91868P 19980706 (60)  
US 1998-91983P 19980706 (60)  
DT Utility  
FS APPLICATION  
LREP SHERIDAN ROSS PC, 1560 BROADWAY, SUITE 1200, DENVER, CO, 80202  
CLMN Number of Claims: 92  
ECL Exemplary Claim: 1  
DRWN 12 Drawing Page(s)  
LN.CNT 4091  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 7 OF 15 USPATFULL on STN  
AN 2003:140544 USPATFULL  
TI High production method of prenyl alcohol by microorganisms  
IN Muramatsu, Masayoshi, Nishikamo-gun, JAPAN  
Obata, Shusei, Nagoya-shi, JAPAN  
Shimizu, Sakayu, Kyoto-shi, JAPAN  
PI US 2003096385 A1 20030522  
US 6974685 B2 20051213  
AI US 2001-22434 A1 20011220 (10)  
PRAI JP 2000-401951 20001228  
JP 2001-375842 20011210  
DT Utility  
FS APPLICATION  
LREP KENYON & KENYON, 1025 Connecticut Avenue, N.W., Washington, DC, 20036-5405  
CLMN Number of Claims: 3  
ECL Exemplary Claim: 1  
DRWN 11 Drawing Page(s)  
LN.CNT 2296  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 8 OF 15 USPATFULL on STN  
AN 2003:134059 USPATFULL  
TI Production of farnesol and geranylgeraniol  
IN Millis, James R., Kohler, WI, UNITED STATES

Maurina-Bunker, Julie, Appleton, WI, UNITED STATES  
McMullin, Thomas W., Manitowoc, WI, UNITED STATES  
PA DCV, Inc. d/b/a Bio-Technical Resources. (U.S. corporation)  
PI US 2003092144 A1 20030515  
US 6689593 B2 20040210  
AI US 2001-909558 A1 20010720 (9)  
RLI Continuation of Ser. No. US 1999-350275, filed on 6 Jul 1999, PENDING  
PRAI US 1998-91964P 19980706 (60)  
DT Utility  
FS APPLICATION  
LREP SHERIDAN ROSS PC, 1560 BROADWAY, SUITE 1200, DENVER, CO, 80202  
CLMN Number of Claims: 70  
ECL Exemplary Claim: 1  
DRWN 8 Drawing Page(s)  
LN.CNT 3644

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 9 OF 15 USPATFULL on STN  
AN 2003:67669 USPATFULL  
TI Method of producing geranylgeraniol  
IN Millis, James R., Kohler, WI, United States  
Maurina-Bunker, Julie, Appleton, WI, United States  
McMullin, Thomas W., Manitowoc, WI, United States  
PA Arkion Life Sciences LLC, Wilmington, DE, United States (U.S.  
corporation)  
PI US 6531303 B1 20030311  
AI US 1999-350275 19990706 (9)  
PRAI US 1998-91964P 19980706 (60)  
DT Utility  
FS GRANTED  
EXNAM Primary Examiner: Achutamurthy, Ponnathapura; Assistant Examiner:  
Walicka, Malgorzata A  
LREP Ross, P.C., Sheridan  
CLMN Number of Claims: 14  
ECL Exemplary Claim: 1  
DRWN 24 Drawing Figure(s); 24 Drawing Page(s)  
LN.CNT 3324

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 10 OF 15 USPATFULL on STN  
AN 2002:329852 USPATFULL  
TI Method for production of geranylgeraniol and analogous compounds thereof  
by microorganisms  
IN Muramatsu, Masayoshi, Nishikamo-gun, JAPAN  
Obata, Shusei, Nagoya-shi, JAPAN  
Shimizu, Sakayu, Kyoto-shi, JAPAN  
PI US 2002187532 A1 20021212  
US 6972191 B2 20051206  
AI US 2001-22695 A1 20011220 (10)  
PRAI JP 2000-401266 20001228  
JP 2001-376173 20011210  
DT Utility  
FS APPLICATION  
LREP KENYON & KENYON, 1500 K STREET, N.W., SUITE 700, WASHINGTON, DC, 20005  
CLMN Number of Claims: 2  
ECL Exemplary Claim: 1  
DRWN No Drawings  
LN.CNT 1676

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 11 OF 15 USPATFULL on STN  
AN 2002:152810 USPATFULL  
TI Method of vitamin production  
IN Millis, James R., Kohler, WI, United States

Saucy, Gabriel G., Essex Fells, NJ, United States  
Maurina-Bunker, Julie, Appleton, WI, United States  
McMullin, Thomas W., Manitowoc, WI, United States  
PA DCV, Inc., Manitowoc, WI, United States (U.S. corporation)  
PI US 6410755 B1 20020625  
AI US 1999-348097 19990706 (9)  
PRAI US 1998-91868P 19980706 (60)  
US 1998-91983P 19980706 (60)  
DT Utility  
FS GRANTED  
EXNAM Primary Examiner: Solola, T. A.  
LREP Sheridan Ross P.C.  
CLMN Number of Claims: 20  
ECL Exemplary Claim: 1  
DRWN 17 Drawing Figure(s); 17 Drawing Page(s)  
LN.CNT 3756  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 12 OF 15 PCTFULL COPYRIGHT 2007 Univentio on STN  
AN 2002003981 PCTFULL ED 20020814  
TIEN METHOD OF MAKING TEPRENONE  
TIFR PROCEDE DE FABRICATION DE TEPRENONE  
IN SAUCY, Gabriel, G.;  
COHEN, Noel  
PA DCV, INC. D/B/A BIO-TECHNICAL RESOURCES  
DT Patent  
PI WO 2002003981 A1 20020117  
DS W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU  
CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN  
IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN  
MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT  
TZ UA UG UZ VN YU ZA ZW GH GM KE LS MW MZ SD SL SZ TZ UG  
ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR  
GB GR IE IT LU MC NL PT SE TR BF BJ CF CG CI CM GA GN GW  
ML MR NE SN TD TG  
PRAI US 2000-60/215,897 20000705  
AI WO 2001-US21398 A 20010705

L3 ANSWER 13 OF 15 USPATFULL on STN  
AN 2001:82552 USPATFULL  
TI Method of vitamin production  
IN Millis, James R., Kohler, WI, United States  
Saucy, Gabriel G., Essex Fells, NJ, United States  
Maurina-Bunker, Julie, Appleton, WI, United States  
McMullin, Thomas W., Manitowoc, WI, United States  
Hyatt, John A., Kingsport, TN, United States  
PA DCV, Inc., Wilmington, DE, United States (U.S. corporation)  
Eastman Chemical Company, Kingsport, TN, United States (U.S.  
corporation)  
PI US 6242227 B1 20010605  
AI US 1999-352654 19990706 (9)  
PRAI US 1998-91868P 19980706 (60)  
DT Utility  
FS Granted  
EXNAM Primary Examiner: Achutamurthy, Ponnathapu; Assistant Examiner: Kerr,  
Kathleen  
LREP Sheridan Ross P.C.  
CLMN Number of Claims: 29  
ECL Exemplary Claim: 1  
DRWN 18 Drawing Figure(s); 18 Drawing Page(s)  
LN.CNT 3840  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 14 OF 15 PCTFULL COPYRIGHT 2007 Univentio on STN

AN 2000001650 PCTFULL ED 20020515  
 TIEN METHOD OF VITAMIN PRODUCTION  
 TIFR PROCEDE DE PRODUCTION DE VITAMINES  
 IN MILLIS, James, R.;  
     SAUCY, Gabriel, G.;  
     MAURINA-BRUNKER, Julie;  
     MCMULLIN, Thomas, W.  
 PA DCV, INC. doing business as BIO-TECHNICAL RESOURCES  
 LA English  
 DT Patent  
 PI WO 2000001650 A1 20000113  
 DS W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE  
     ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ  
     LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU  
     SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZA ZW GH GM  
     KE LS MW SD SL SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE  
     CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF  
     CG CI CM GA GN GW ML MR NE SN TD TG  
 PRAI US 1998-60/091,983 19980706  
       US 1998-60/091,951 19980706  
       US 1998-60/091,964 19980706  
 AI WO 1999-US15264 A 19990706  
  
 L3 ANSWER 15 OF 15 PCTFULL COPYRIGHT 2007 Univentio on STN  
 AN 2000001649 PCTFULL ED 20020515  
 TIEN METHOD OF VITAMIN PRODUCTION  
 TIFR PROCEDE DE PRODUCTION DE VITAMINES  
 IN MILLIS, James, R.;  
     SAUCY, Gabriel, G.;  
     MAURINA-BRUNKER, Julie;  
     MCMULLIN, Thomas, W.;  
     HYATT, John, A.  
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     EASTMAN CHEMICAL COMPANY  
 LA English  
 DT Patent  
 PI WO 2000001649 A1 20000113  
 DS W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE  
     ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ  
     LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU  
     SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZA ZW GH GM  
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 PRAI US 1998-60/091,868 19980706  
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